1 Identification

· Product identifier
  · Trade name: SM-102
  · Article number: 33474

· Application of the substance / the mixture
  This product is for research use - Not for human or veterinary diagnostic or therapeutic use.

· Details of the supplier of the safety data sheet
  · Manufacturer/Supplier: Cayman Chemical Co.
    1180 E. Ellsworth Rd.
    Ann Arbor, MI 48108
    USA
  · Information department: Product safety department
  · Emergency telephone number:
    During normal opening times: +1 (734) 971-3335
    US/CANADA: 800-424-9300
    Outside US/CANADA: 703-741-5970

2 Hazard(s) identification

· Classification of the substance or mixture
  · GHS02 Flame
    Flam. Liq. 2  H225 Highly flammable liquid and vapor.
  · GHS06 Skull and crossbones
    Acute Tox. 3  H301 Toxic if swallowed.
    Acute Tox. 3  H331 Toxic if inhaled.
  · GHS08 Health hazard
    Carc. 1A  H350 May cause cancer.

(Contd. on page 2)
Trade name: SM-102

Eye Irrit. 2A  H319 Causes serious eye irritation.

· Label elements
· GHS label elements
The product is classified and labeled according to the Globally Harmonized System (GHS).
· Hazard pictograms

GHS02  GHS06  GHS07  GHS08

· Signal word Danger
· Hazard-determining components of labeling:
ethanol
· Hazard statements
H225  Highly flammable liquid and vapor.
H301+H331  Toxic if swallowed or if inhaled.
H319  Causes serious eye irritation.
H350  May cause cancer.
· Precautionary statements
P201  Obtain special instructions before use.
P202  Do not handle until all safety precautions have been read and understood.
P210  Keep away from heat/sparks/open flames/hot surfaces. - No smoking.
P240  Ground/bond container and receiving equipment.
P241  Use explosion-proof electrical/ventilating/lighting/equipment.
P242  Use only non-sparking tools.
P243  Take precautionary measures against static discharge.
P261  Avoid breathing dust/fume/gas/mist/vapors/spray
P264  Wash thoroughly after handling.
P270  Do not eat, drink or smoke when using this product.
P271  Use only outdoors or in a well-ventilated area.
P280  Wear protective gloves/protective clothing/eye protection/face protection.
P301+P310  If swallowed: Immediately call a poison center/doctor.
P304+P340  IF INHALED: Remove person to fresh air and keep comfortable for breathing.
P305+P351+P338  If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P308+P313  IF exposed or concerned: Get medical advice/attention.
P317+P337  If eye irritation persists: Get medical advice/attention.
P370+P378  In case of fire: Use CO2, powder or water spray to extinguish.
P403+P233  Store in a well-ventilated place. Keep container tightly closed.
P403+P235  Store in a well-ventilated place. Keep cool.
P405  Store locked up.
P501  Dispose of contents/container in accordance with local/regional/national/international regulations.

· Classification system:
· NFPA ratings (scale 0 - 4)

Health = 2
Fire = 0
Reactivity = 0
HMIS-ratings (scale 0 - 4)
- Health = *2
- Fire = 0
- Reactivity = 0

Other hazards
- Results of PBT and vPvB assessment
- PBT: Not applicable.
- vPvB: Not applicable.

3 Composition/information on ingredients
- Chemical characterization: Mixtures
- Description: Mixture of the substances listed below with nonhazardous additions.

<table>
<thead>
<tr>
<th>Dangerous components:</th>
</tr>
</thead>
<tbody>
<tr>
<td>CAS: 64-17-5 ethanol</td>
</tr>
<tr>
<td>RTECS: KQ6300000</td>
</tr>
<tr>
<td>90.0%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Other ingredients</th>
</tr>
</thead>
<tbody>
<tr>
<td>2089251-47-6 SM-102</td>
</tr>
<tr>
<td>10.0%</td>
</tr>
</tbody>
</table>

4 First-aid measures
- Description of first aid measures
- General information:
  - Immediately remove any clothing soiled by the product.
  - Remove breathing apparatus only after contaminated clothing have been completely removed.
  - In case of irregular breathing or respiratory arrest provide artificial respiration.
- After inhalation:
  - Supply fresh air or oxygen; call for doctor.
  - In case of unconsciousness place patient stably in side position for transportation.
- After skin contact:
  - Immediately wash with water and soap and rinse thoroughly.
- After eye contact:
  - Rinse opened eye for several minutes under running water. If symptoms persist, consult a doctor.
- After swallowing:
  - Do not induce vomiting; immediately call for medical help.
- Information for doctor:
  - Most important symptoms and effects, both acute and delayed
    - May cause anemia, cough, CNS depression, drowsiness, headache, heart damage, lassitude (weakness, exhaustion), liver damage, narcosis, reproductive effects, teratogenic effects.
  - Indication of any immediate medical attention and special treatment needed
    - No further relevant information available.

5 Fire-fighting measures
- Extinguishing media
- Suitable extinguishing agents:
  - CO2, extinguishing powder or water spray. Fight larger fires with water spray or alcohol resistant foam.
- Special hazards arising from the substance or mixture
  - No further relevant information available.
6 Accidental release measures

- **Personal precautions, protective equipment and emergency procedures**
  Wear protective equipment. Keep unprotected persons away.

- **Environmental precautions:**
  Dilute with plenty of water.
  Do not allow to enter sewers/surface or ground water.

- **Methods and material for containment and cleaning up:**
  Absorb with liquid-binding material (sand, diatomite, acid binders, universal binders, sawdust).
  Dispose contaminated material as waste according to item 13.
  Ensure adequate ventilation.

- **Reference to other sections**
  See Section 7 for information on safe handling.
  See Section 8 for information on personal protection equipment.
  See Section 13 for disposal information.

- **Protective Action Criteria for Chemicals**
  | PAC-1: | 64-17-5 ethanol | 1,800 ppm |
  | PAC-2: | 64-17-5 ethanol | 3300 ppm |
  | PAC-3: | 64-17-5 ethanol | 15000 ppm |

7 Handling and storage

- **Handling:**
  **Precautions for safe handling**
  Ensure good ventilation/exhaustion at the workplace.
  Open and handle receptacle with care.
  Prevent formation of aerosols.

- **Information about protection against explosions and fires:**
  Keep ignition sources away - Do not smoke.
  Protect against electrostatic charges.
  Keep respiratory protective device available.

- **Conditions for safe storage, including any incompatibilities**
  **Storage:**
  **Requirements to be met by storerooms and receptacles:** Store in a cool location.
  **Information about storage in one common storage facility:** Not required.
  **Further information about storage conditions:**
  Keep receptacle tightly sealed.
  Store in cool, dry conditions in well sealed receptacles.
  **Specific end use(s) No further relevant information available.**

8 Exposure controls/personal protection

- **Additional information about design of technical systems:** No further data; see item 7.
· **Control parameters**

<table>
<thead>
<tr>
<th>Components with limit values that require monitoring at the workplace:</th>
</tr>
</thead>
<tbody>
<tr>
<td>64-17-5 ethanol</td>
</tr>
<tr>
<td>PEL Long-term value: 1900 mg/m³, 1000 ppm</td>
</tr>
<tr>
<td>REL Long-term value: 1900 mg/m³, 1000 ppm</td>
</tr>
<tr>
<td>TLV Short-term value: 1000 ppm</td>
</tr>
</tbody>
</table>

· **Additional information:** The lists that were valid during the creation were used as basis.

· **Exposure controls**

· **Personal protective equipment:**

· **General protective and hygienic measures:**
  - Keep away from foodstuffs, beverages and feed.
  - Immediately remove all soiled and contaminated clothing.
  - Wash hands before breaks and at the end of work.
  - Store protective clothing separately.
  - Avoid contact with the eyes.
  - Avoid contact with the eyes and skin.

· **Breathing equipment:**
  - In case of brief exposure or low pollution use respiratory filter device. In case of intensive or longer exposure use respiratory protective device that is independent of circulating air.

· **Protection of hands:**

  - **Protective gloves**

  The glove material has to be impermeable and resistant to the product/ the substance/ the preparation. Due to missing tests no recommendation to the glove material can be given for the product/ the preparation/ the chemical mixture. Selection of the glove material on consideration of the penetration times, rates of diffusion and the degradation

  - **Material of gloves**

  The selection of the suitable gloves does not only depend on the material, but also on further marks of quality and varies from manufacturer to manufacturer. As the product is a preparation of several substances, the resistance of the glove material can not be calculated in advance and has therefore to be checked prior to the application.

  - **Penetration time of glove material**

  The exact break through time has to be found out by the manufacturer of the protective gloves and has to be observed.

· **Eye protection:**

  - **Tightly sealed goggles**

(Contd. from page 4)
# 9 Physical and chemical properties

## Information on basic physical and chemical properties

### General Information

- **Appearance:** Liquid
- **Color:** According to product specification
- **Odor:** Characteristic
- **Structural Formula:** C44H87NO5
- **Molecular Weight:** 710.2
- **Odor threshold:** Not determined.
- **Formulation:** A solution in ethanol

### pH-value:

Not determined.

### Change in condition

- **Melting point/Melting range:** Undetermined.
- **Boiling point/Boiling range:** 78 °C (172.4 °F)

### Flash point:

13 °C (55.4 °F)

### Flammability (solid, gaseous):

Not applicable.

### Ignition temperature:

982 °C (1,799.6 °F)

### Decomposition temperature:

Not determined.

### Auto igniting:

Product is not selfigniting.

### Danger of explosion:

Product is not explosive. However, formation of explosive air/vapor mixtures are possible.

### Explosion limits:

- Lower: 3.5 Vol %
- Upper: 15 Vol %

### Vapor pressure at 20 °C (68 °F):

59 hPa (44.3 mm Hg)

### Density at 20 °C (68 °F):

1.47988 g/cm³ (12.3496 lbs/gal)

### Bulk density:

1,480 kg/m³

### Relative density:

Not determined.

### Vapor density:

Not determined.

### Evaporation rate:

Not determined.

### Solubility in / Miscibility with

- **Water:** Fully miscible.

### Partition coefficient (n-octanol/water):

Not determined.

### Viscosity:

- Dynamic at 20 °C (68 °F): 0.56 mPas
- Kinematic: Not determined.

### Solvent content:

- **Organic solvents:** 90.0 %
- **VOC content:** 90.00 %
- **Solids content:** 1,331.9 g/l / 11.12 lb/gal

### Solids content:

0.0 %
10 Stability and reactivity

- **Reactivity** No further relevant information available.
- **Chemical stability**
  - **Thermal decomposition / conditions to be avoided:** No decomposition if used according to specifications.
  - **Possibility of hazardous reactions** No dangerous reactions known.
  - **Conditions to avoid** No further relevant information available.
  - **Incompatible materials:** No further relevant information available.
  - **Hazardous decomposition products:** No dangerous decomposition products known.

11 Toxicological information

- **Information on toxicological effects**
- **Acute toxicity:**

<table>
<thead>
<tr>
<th>LD/LC50 values that are relevant for classification:</th>
<th>64-17-5 ethanol</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oral</td>
<td>TDLO 1.14 ml/kg (man)</td>
</tr>
<tr>
<td></td>
<td>TDLO 650 (man)</td>
</tr>
<tr>
<td>Dermal</td>
<td>LD50 40,000 mg/kg (rat)</td>
</tr>
<tr>
<td>Inhalative</td>
<td>LC50/4 h 5,900 mg/m³ (rat)</td>
</tr>
<tr>
<td></td>
<td>LC50 20,000 mg/m³/10h (rat)</td>
</tr>
<tr>
<td></td>
<td>TCLO 1,800 mg/m³/30m (hmnn)</td>
</tr>
<tr>
<td></td>
<td>LCLO 29,300 mg/m³/7h (mouse)</td>
</tr>
<tr>
<td></td>
<td>TCLO 1,800 (hmnn)</td>
</tr>
<tr>
<td></td>
<td>LC50 10 h - 20,000 mg/m³ (rat)</td>
</tr>
<tr>
<td></td>
<td>LD50 Inhalation TCLO 1,800 mg/m³/30m (hmnn)</td>
</tr>
<tr>
<td></td>
<td>LC50/4 h 20,000 mg/l (rat)</td>
</tr>
<tr>
<td>Irritation of skin</td>
<td>Irritation 20 mg/24h (rabbit)</td>
</tr>
<tr>
<td></td>
<td>TDLO 1,800 mg/kg (wmn)</td>
</tr>
<tr>
<td>Irritation of eyes</td>
<td>Irritation 500 mg/24h (rabbit)</td>
</tr>
<tr>
<td></td>
<td>Intraperitoneal LD50 280 mg/kg (rat)</td>
</tr>
<tr>
<td></td>
<td>Data 500 mg/24h (rabbit)</td>
</tr>
</tbody>
</table>

- **Primary irritant effect:**
  - **on the skin:** No irritant effect.
  - **on the eye:** Irritating effect.
  - **Sensitization:** No sensitizing effects known.
- **Additional toxicological information:**
  The product shows the following dangers according to internally approved calculation methods for preparations:
  - Toxic
  - Irritant
12 Ecological information

- Toxicity
  - Aquatic toxicity: No further relevant information available.
  - Persistence and degradability: No further relevant information available.
- Behavior in environmental systems:
  - Bioaccumulative potential: No further relevant information available.
  - Mobility in soil: No further relevant information available.
- Additional ecological information:
  - General notes:
    Water hazard class 1 (Self-assessment): slightly hazardous for water
    Do not allow undiluted product or large quantities of it to reach ground water, water course or sewage system.
  - Results of PBT and vPvB assessment
    - PBT: Not applicable.
    - vPvB: Not applicable.
- Other adverse effects: No further relevant information available.

13 Disposal considerations

- Waste treatment methods
  - Recommendation:
    Must not be disposed of together with household garbage. Do not allow product to reach sewage system.
- Uncleaned packagings:
  - Recommendation: Disposal must be made according to official regulations.
  - Recommended cleansing agent: Water, if necessary with cleansing agents.

14 Transport information

- UN-Number
  - DOT, IMDG, IATA: UN1170
- UN proper shipping name
  - DOT: Ethanol solutions
  - IMDG: ETHANOL SOLUTION (ETHYL ALCOHOL SOLUTION)
  - IATA: Ethanol solution
**Trade name: SM-102**

<table>
<thead>
<tr>
<th>Transport hazard class(es)</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>DOT</td>
<td></td>
</tr>
</tbody>
</table>

- **Class**: 3 Flammable liquids
- **Label**: 3

<table>
<thead>
<tr>
<th>IMDG, IATA</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- **Class**: 3 Flammable liquids
- **Label**: 3

<table>
<thead>
<tr>
<th>Packing group</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>DOT, IMDG, IATA</td>
<td>II</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Environmental hazards:</th>
<th>Not applicable.</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Special precautions for user</th>
<th>Warning: Flammable liquids</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hazard identification number (Kemler code):</td>
<td>33</td>
</tr>
<tr>
<td>EMS Number:</td>
<td>F-E,S-D</td>
</tr>
<tr>
<td>Stowage Category</td>
<td>A</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code</th>
<th>Not applicable.</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Transport/Additional information:</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>DOT</td>
<td></td>
</tr>
<tr>
<td>Quantity limitations</td>
<td>On passenger aircraft/rail: 5 L On cargo aircraft only: 60 L</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>IMDG</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Limited quantities (LQ)</td>
<td>1L</td>
</tr>
<tr>
<td>Exected quantities (EQ)</td>
<td>Code: E2 Maximum net quantity per inner packaging: 30 ml Maximum net quantity per outer packaging: 500 ml</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>IATA</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Remarks:</td>
<td>When sold in quantities of less than or equal to 1 mL, or 1 g, with an Excepted Quantity Code of E1, E2, E4, or E5, this item meets the De Minimis Quantities exemption, per IATA 2.6.10. Therefore packaging does not have to be labeled as Dangerous Goods/Excepted Quantity.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>UN &quot;Model Regulation&quot;:</th>
<th>UN 1170 ETHANOL SOLUTION (ETHYL ALCOHOL SOLUTION), 3, II</th>
</tr>
</thead>
</table>

*(Contd. from page 8)*
15 Regulatory information

- Safety, health and environmental regulations/legislation specific for the substance or mixture
  - Sara
    - Section 355 (extremely hazardous substances):
      None of the ingredients is listed.
    - Section 313 (Specific toxic chemical listings):
      None of the ingredients is listed.
    - TSCA (Toxic Substances Control Act):
      64-17-5 ethanol
      - Hazardous Air Pollutants
        None of the ingredients is listed.
      - Proposition 65
        - Chemicals known to cause cancer:
          None of the ingredients is listed.
        - Chemicals known to cause reproductive toxicity for females:
          None of the ingredients is listed.
        - Chemicals known to cause reproductive toxicity for males:
          None of the ingredients is listed.
        - Chemicals known to cause developmental toxicity:
          64-17-5 ethanol
      - Carcinogenic categories
        - EPA (Environmental Protection Agency)
          None of the ingredients is listed.
        - TLV (Threshold Limit Value)
          64-17-5 ethanol
          - NIOSH-Ca (National Institute for Occupational Safety and Health)
            None of the ingredients is listed.
        - National regulations:
          - Information about limitation of use:
            Workers are not allowed to be exposed to the hazardous carcinogenic materials contained in this preparation. Exceptions can be made by the authorities in certain cases.
          - Chemical safety assessment:
            A Chemical Safety Assessment has not been carried out.

16 Other information

All chemicals may pose unknown hazards and should be used with caution. This SDS applies only to the material as packaged. If this product is combined with other materials, deteriorates, or becomes contaminated, it may pose hazards not mentioned in this SDS. Cayman Chemical Company assumes no responsibility for incidental or consequential damages, including lost profits, arising from the use of these data. It shall be the user's responsibility to develop proper methods of handling and personal protection based on the actual conditions of use. While this SDS is based on technical data judged to be reliable, Cayman Chemical Company assumes no responsibility for the completeness or accuracy of the information contained herein.

- Department issuing SDS: Environment protection department.
· **Contact:** -
· **Date of preparation / last revision** 09/15/2021 / -

**Abbreviations and acronyms:**
- IMDG: International Maritime Code for Dangerous Goods
- DOT: US Department of Transportation
- IATA: International Air Transport Association
- EINECS: European Inventory of Existing Commercial Chemical Substances
- ELINCS: European List of Notified Chemical Substances
- CAS: Chemical Abstracts Service (division of the American Chemical Society)
- NFPA: National Fire Protection Association (USA)
- HMIS: Hazardous Materials Identification System (USA)
- VOC: Volatile Organic Compounds (USA, EU)
- LC50: Lethal concentration, 50 percent
- LD50: Lethal dose, 50 percent
- PBT: Persistent, Bioaccumulative and Toxic
- vPvB: very Persistent and very Bioaccumulative
- NIOSH: National Institute for Occupational Safety
- OSHA: Occupational Safety & Health
- TLV: Threshold Limit Value
- PEL: Permissible Exposure Limit
- REL: Recommended Exposure Limit
- Flam. Liq. 2: Flammable liquids – Category 2
- Acute Tox. 3: Acute toxicity – Category 3
- Eye Irrit. 2A: Serious eye damage/eye irritation – Category 2A
- Carc. 1A: Carcinogenicity – Category 1A

* Data compared to the previous version altered.